1. The final product, D, in the following reaction sequence,

2. What is the product, A, that would be obtained from the following reaction sequence?

$$C = CH \qquad CH_3CH_2MgBr \qquad CH_3CH - CHCH_3 \qquad H_3O^+ \qquad A$$

$$CH_3 \qquad CH_3 \qquad CH_4 \qquad C = CCH - CHOH$$

$$I \qquad \qquad III \qquad \qquad III$$

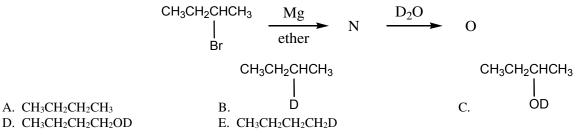
$$CH_3 \qquad CH_3 \qquad$$

3. What would be the product, C, of the following reaction sequence?

- A. 2,6-Dimethylheptane
- C. 2-Methylpentane
- E. 2,2,6-Trimethylheptane

- B. 2,2-Dimethylpropane
- D. 2,2,5-Trimethylhexane

4. What would be the product, O, of the following reaction sequence?



- 5. What is the product, A, that would be obtained from the following reaction sequence?
 - A. I
 - B. II
 - C. III
 - D. IV
 - E. V

$$HO \downarrow IV$$
 V

- 6. What would be the final product, A, in the following reaction sequence?
 - A. I
 - B. II
 - C. III
 - D. IV
 - E. V

- 7. What would be the major product of the following reaction?
 - A. (R)-3-ethyl-5-methylheptane
 - B. (R,S)-3-ethyl-5-methylheptane
 - C. (S)-3-ethyl-5-methylheptane
 - D. (3R,5S)-5-ethyl-3-methylheptane
 - E. (3S,5R)-5-ethyl-3-methylheptane

- Cl Li, Et₂O CuI H CH₃ A
- 8. What is the principal product(s) formed when 1 mol of methylmagnesium iodide reacts with 1 mol of p-hydroxyacetophenone?
 - A. I
 - B. II
 - C. III
 - D. IV
 - E. V

9. What product(s) is/are produced in the 1:1 reaction of sec-butylmagnesium bromide with CH₃CHCH₂CH₂C=O

10. What is the principal product of the following reaction:

- 11. The reaction of lithium diethylcuprate with 1-bromo-4,4-dimethylhexane yields:
 - A. 3,3-Dimethylheptane

B. 3,3-Dimethyloctane

C. 1-Ethyl-4,4-dimethylhexane

D. Di-4,4-dimethylhexylcuprate

E. None of the above

- 12. Which of the following synthetic procedures would be employed most effectively to transform ethanol into ethyl propyl ether?
 - A. Ethanol + HBr, then Mg/ether, then H₃O⁺, then NaH, then CH₃CH₂Br
 - B. Ethanol + HBr, then Mg/ether, then HCHO, then H₃O⁺, then NaH, then CH₃CH₂Br
 - C. Ethanol + $CH_3CH_2CH_2OH + H_2SO_4/140$ °C
 - D. Ethanol + NaH, then HCHO, then H₃O⁺, then HBr, then Mg/ether, then CH₃CH₂CH₂Br
 - E. Ethanol + H₂SO₄/180°C, then CH₃CH₂CH₂Br

13. What compound(s) result(s) from the reaction of CH₃CH₂CH₂CH₂MgBr with CH₃CH₂CH₂CH₂CO₂H (1:1 mole ratio)?

A.

CH₃CH₂CH₂CH₂COCH₂CH₂CH₃

D. CH₃CH₂CH₃ + CH₃CH₂CH₂CH₂CO₂MgBr

CH₃CH₂COCCH₂CH₂CH₂CH₃

14. Your task is to synthesize would you choose as starting materials? through a Grignard synthesis. Which pairs of compounds listed below

CH₃CH₂CH₂Br and CH₃CC₆H₅

O
$$CH_3CH_2CHCH_3$$
 \parallel and \parallel C C_6H_5CH Br

D. More than one of these. Which ones?

- E. None of these
- 15. Your task is to synthesize 2-phenyl-2-hexanol through a Grignard synthesis. Which pair(s) of compounds listed below would you choose as starting materials?

CH₃CH₂CH₂Br and CH₃CC₆H₅

В.

D. Answers A or B

- E. Answers A or C
- 16. Which combination of reagents is to be preferred for the synthesis of 2,4-dimethylhexane by the Corey-Posner, Whitesides-House procedure?
 - A. Lithium diisobutylcuprate + sec-butyl bromide
 - B. Lithium dimethylcuprate + 2-bromo-4-methylhexane
 - C. Lithium dimethylcuprate + 4-bromo-2-methylhexane
 - D. Lithium diisopropylcuprate + 1-bromo-2-methylbutane
 - E. Lithium di(2-methylbutyl)cuprate + isopropyl bromide

- 17. Which of the following would serve as a synthesis of racemic 2-methyl-1-phenyl-2-butanol?
 - A. I
 - B. II
 - C. III
 - D. All of the above
 - E. None of the above

$$I \qquad \begin{array}{c} \text{CH}_3\text{CH}_2\text{CCH}_3 \\ \parallel \\ \text{O} \end{array} + \begin{array}{c} \boxed{} \text{CH}_2\text{MgCl} \end{array} \begin{array}{c} 1. \text{ Et}_2\text{O} \\ \hline 2. \text{ NH}_4^+ \end{array}$$

II
$$\sim$$
 CH₂CCH₃ + CH₃CH₂MgBr \sim 2. NH₄⁺

18. Which Grignard synthesis will produce an optically active product or product mixture?

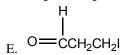
- 19. Which of the following is the strongest acid?
 - A. RMgX
- B. Mg(OH)X
- C. RH
- D. H₂O
- 20. Which of the following is the strongest base?
 - A. RMgX
- B. Mg(OH)X
- C. RH
- D. H₂O
- 21. Grignard reagents react with oxirane (ethylene oxide) to form 1° alcohols but <u>can be prepared</u> in tetrahydrofuran solvent. Why is this difference in behavior observed?
 - A. Steric hindrance in the case of tetrahydrofuran precludes reaction with the Grignard.
 - B. There is a better leaving group in the oxirane molecule.
 - C. The oxirane ring is the more highly strained.
 - D. It is easier to obtain tetrahydrofuran in anhydrous condition.
 - E. Oxirane is a cyclic ether, while tetrahydrofuran is a hydrocarbon.
- 22. Which of these compounds can be used to prepare the corresponding Grignard reagent?
 - A. CH₃CHOHCH₂CH₂CH₂CH₂Br
 - B. (CH₃)₃CHCHBrCH₂CH₂CO₂H
 - C. BrCH=CHCH₂CH₂CH₃
 - D. CH₃NHCH₂CH₂Br
 - E. None of the above can be used to prepare the corresponding Grignard reagent

- 23. Which of these compounds *cannot* be used to prepare the corresponding Grignard reagent?
 - A. CH₃OCH₂CH₂CH₂Br

B. (CH₃)₃CCl

C. CH₂=CHCH₂Br

D. (CH₃)₂NCH₂CH₂Br



- 24. Which of these is the <u>least</u> reactive type of organometallic compound?
 - A. RK
- B. R₂Hg
- C. RLi
- D. R₂Zn
- E. R₃A1
- 25. If the role of the solvent is to assist in the preparation and stabilization of the Grignard reagent by coordination with the magnesium, which of these solvents should be least effective?
 - A. I
 - B. II
 - C. III
 - D. IV E. V

- CH₃CH₂OCH₂CH₃
- $(CH_3CH_2)_3N$

III

I

IV

CH₃(CH₂)₄CH₃ CH₃OCH₂CH₂OCH₃

- 26. Which of these is most likely to be a successful synthesis of an organometallic compound?

 - B. $2 \text{ CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Li} + \text{ZnCl}_2$ \longrightarrow $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{Zn} + 2 \text{LiCl}$ C. $3 (\text{CH}_3\text{CH}_2)_2\text{Hg} + 2 \text{AlCl}_3$ \longrightarrow $2 (\text{CH}_3\text{CH}_2)_3\text{Al} + 3 \text{HgCl}_2$ D. $(\text{CH}_3\text{CH}_2)_3\text{Al} + 3 \text{NaCl}$ \longrightarrow $3 \text{CH}_3\text{CH}_2\text{Na} + \text{AlCl}_3$

 - E. $(CH_3)_2Cu + MgBr_2 \longrightarrow (CH_3)_2Mg + CuBr_2$
- 27. What is the product of the following reaction?
- OH OH
- 1) 2 CH₃MgBr 2) H₃O⁺

V

- OH 2)
- OH
- 28. 1-Phenylnaphthalene, shown below, can be prepared in over 80% yield by one of the reactions below. Which one?
 - C₆H₆, AlCl₃
- C1 C_6H_5MgBr diethyl ether

 C_6H_5

- $(C_6H_5)_2CuLi$
- C₆H₅Br, AlCl₃

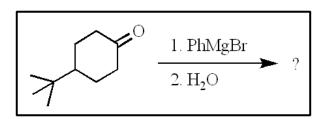
29. How many stereoisomers are formed in this reaction?

A. just one

B. two

C. three

D. four



30. What is being made in this reaction?

$$H_{3}$$
C

 H_{3} C

 H_{3

$$H_3C$$
 C
 OCH_2CH_3
 OCH_2

31. What would be the final product, A, in the following reaction sequence?

A. I B. II

C. III D. IV E. V

Br

IV

_	 	

DATE_____

ANSWER SHEET CHE 325 - CHAP 14 ASSIGN

1	13	25	37
2	14	26	38
3	15	27	39
4	16	28	40
5	17	29	41
6	18	30	42
7	19	31	43
8	20	32	44
9	21	33	45
10	22	34	46
11	23	35	47
12	24	36	48SS II 2015